DOCUMENT RESUME

ED 320 123 CS 010 118

AUTHOR Armbruster, Bonnie B.; And Others

TITLE Reading and Questioning in Content Area Lessons. Technical Report No. 502.

INSTITUTION Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE Jun 90
CONTRACT G0087-C1001-90
NOTE 28p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Content Area Reading; Educational Research; *Elementary School Science; Grade 4; Intermediate Grades; *Reading Assignments; Science Instruction; *Social Studies; Teacher Response; Teaching Methods; *Textbooks
IDENTIFIERS *Questions

ABSTRACT

An analysis was conducted of 12 fourth-grade science and social studies lessons in which a textbook was used as a focus of instruction. The purpose was to determine how the textbook was used by teachers and students, and in particular, to determine what kinds of questions the teachers asked during the textbook-based lessons. The results replicate and extend several findings from previous research. Results indicated that (1) even when textbooks were used during instruction, students did not do very much reading, and the reading they did was round-robin oral reading; (2) the teachers asked a large number of questions; (3) very few of these questions came from textbooks; rather, the teachers made up about 90% of their own questions; and (4) only about one-fourth of the questions asked were about the text segment currently being read, and of those questions, text explicit questions outnumbered text implicit questions two to one. Also of interest were the large number of question repetitions and rhetorical questions (questions that did not appear to elicit a response). (Eight tables of data are included, and 33 references are attached.) (Author/MG)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED320123

CENTER FOR THE STUDY OF READING

Technical Report No. 502

READING AND QUESTIONING IN CONTENT AREA LESSONS

Bonnie B. Armbruster
Thomas H. Anderson
James O. Armstrong
Marsha A. Wise
Carole Janisch
Linda A. Meyer

University of Illinois at Urbana-Champaign

June 1990

University of Illinois at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

D. ANDERSON

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

The work upon which this publication was based was supported in part by the Office of Educational Research and Improvement under Cooperative Agreement No. G0087-C1001-90 with the Reading Research and Education Center. The publication does not necessarily reflect the views of the agency supporting the research.

CS010118

BEST COPY AVAILABLE

EDITORIAL ADVISORY BOARD
1989-90

James Armstrong
Linda Asmussen
Gerald Arnold
Yahaya Bello
Diane Bottomley
Catherine Burnham
Candace Clark
Michelle Commeyras
John M. Consalvi
Christopher Currie
Irene-Anna Diakidoy
Barbara Hancin
Michael J. Jacobson
Jihn-Chang Jehng
Robert T. Jimenez
Bonnie M. Kerr
Paul W. Kerr
Juan Moran
Keisuke Ohtsuka
Kathy Meyer Reimer
Hua Shu
Anne Stallman
Marty Waggoner
Janelle Weinzierl
Pamela Winsor
Marsha Wise

MANAGING EDITOR
Fran Lehr

MANUSCRIPT PRODUCTION ASSISTANTS
Delores Plowman
Debra Gough

Abstract

An analysis was conducted of 12 fourth-grade science and social studies lessons in which a textbook was used as a focus of instruction. The purpose was to determine how the textbook was used by teachers and students, and in particular, to determine what kinds of questions the teachers asked during the textbook-based lessons. The results replicate and extend several findings from previous research. First, even when textbooks were used during instruction, students did not do very much reading, and the reading they did was round robin oral reading. Second, the teachers asked a large number of questions. Third, very few of these questions came from textbooks; rather, the teachers made up about 90% of their own questions. Finally, only about one-fourth of the questions asked were about the text segment currently being read, and of those questions, text explicit questions outnumbered text implicit questions two to one. Also of interest were the large number of question repetitions and rhetorical questions (questions that did not appear to elicit a response).

READING AND QUESTIONING IN CONTENT AREA LESSONS

Students have difficulty understanding and learning from informational text. A recent summary of findings from the National Assessment of Educational Progress (Applebee, Langer, & Mullis, 1989) includes this dismal conclusion about the reading ability of American students:

> For example, the failure of 61 percent of the 17-year-olds to demonstrate the ability to find, understand, summarize, and explain relatively complicated information, including material about topics they study in school, suggests that most students leaving secondary school do not have the comprehension skills often needed in the worlds of higher education, business, or government. (p. 22)

Why do so many students have trouble with informational text? Research suggests two reasons that are relevant to this study. First, students don't read much informational text, so they are unfamiliar with the genre. Second, the instruction students receive doesn't foster the development of conceptual understanding and meaningful learning.

We'll begin with the claim that students don't read much informational text. The pattern begins when students are first learning to read. Most children learn to read from the readers in basal programs. Most of the selections in basal readers are narratives (Flood & Lapp, 1987). The few informational selections that are included bear little resemblance to the informational text of content area textbooks (Beck, McKeown, & Gromoll, 1986). For example, expository selections in basals are often about unusual topics of high interest to children (e.g., secret codes and buried treasure). Also, they are short and self-contained, bearing little if any relationship to surrounding selections. Unfortunately, for many students, what they read in their basal readers constitutes the vast majority of their total reading (Anderson, Hiebert, Scott, & Wilkinson, 1985). Therefore, most students get little practice in reading informational text, and the text they do read is not like that of their content area textbooks.

Although students may not encounter much informational text early in their schooling or in conjunction with learning to read, it may be assumed that students learn most content material (for example, science and social studies) primarily from reading content area textbooks. This assumption is probably held because "according to virtually all studies of the matter, textbooks have become the de facto curriculum of the public schools" (Tyson-Bernstein, 1988, p. 11).

Most research suggests that textbook reading by students may not be as prevalent as assumed. In our review of the literature, we found only one study supporting the assumption of heavy textbook use. In a survey of 80 fifth-grade teachers in South Dakota, Hill (1983) found that 97% used round robin oral reading of the textbook at least three times a week in social studies or science instruction. According to classroom observation studies, students depend on the teacher, not the textbook, as the primary source of information. For example, in their research with both middle and high school classrooms, Smith and Feathers (1983a; 1983b) concluded that reading did not figure importantly in teaching or learning in the content areas. In their study of eight teachers in Grades 8-11, Ratekin, Simpson, Alvermann, and Dishner (1985) found that the teacher, rather than the text, was the primary source of information. According to Davey's (1988) survey of 90 elementary and secondary school teachers, teachers did not perceive themselves as using textbooks as the basis for content learning. Finally, Goodlad (1984) presented evidence that at the high school level, less than 5% of class time is spent in reading.

Textbooks may not be used often in classrooms, but when they *are* used, they tend to be read in small segments by students reading aloud--the so-called "round robin reading" method. In addition to Hill's (1983) findings, Pearson and Gallagher (1983) studied 40 teachers teaching a variety of subjects and

found that 65% used round robin oral reading. A study by Durkin (1978-79) also provided evidence of the prevalent use of round robin reading in social studies instruction.

Our second claim is that instruction does not typically foster the development of conceptual understanding and meaningful learning from informational text. The classic study to support this claim is Durkin's (1978-79) study of comprehension instruction in reading and social studies classrooms in Grades 3-6. Durkin defined comprehension instruction as the explicit teaching of how to accomplish a particular comprehension skill. Using this definition, she observed almost no comprehension instruction in either reading or social studies lessons. Regarding social studies, Durkin's conclusion was, "None of the observed teachers saw the social studies period as a time to improve children's comprehension abilities. Instead, all were concerned about covering content and with having children master facts" (p. 521).

The failure to teach comprehension skills explicitly is only one pitfall. Other instructional practices may also hinder the development of conceptual understanding and meaningful learning. One important instructional practice is teacher questioning. As Gall (1970) put it, "It is a truism for educators that questions play an important role in teaching" (p. 707). The recitation method predominates in American classrooms: Teachers ask questions, students respond, and sometimes teachers react to that response (Gall, 1984; Goodlad, 1984; Alvermann & Hayes, 1989).

Indeed, teachers ask a great many questions. Gall (1970) cited several studies, dating back to 1912, that demonstrated the prevalence of questioning in classrooms. More recently, in a study of 38 teachers in Grades 2-12, Daines (1986) found that teachers asked about 1.3 questions per minute, and that they spent 40% of the lesson time asking questions and responding to student questions.

Where do teachers get all the questions they ask? Once again, a common assumption is that teachers depend heavily on textbooks for questions. After all, both the students' and teachers' editions of most content area textbooks are replete with questions to be asked before, during, and after reading. A study by Shake and Allington (1985), however, casts doubt on the assumption that teachers use textbook questions. At least for reading instruction, teachers tended to use their own questions (79%) rather than questions from the basal reading program (21%).

What kinds of questions do teachers ask? The overwhelming result of research on teacher questioning is that teachers ask primarily factual or memory-type questions that focus on isolated bits of information. (See, for example, Alvermann & Hayes, 1989; Ciardello, 1986; Daines, 1986; Gall, 1970, 1984; Good & Brophy, 1973; Guszak, 1967; Pearson & Gallagher, 1983; Wilen, 1982, 1984). We found only two studies (Hare & Pulliam, 1980; O'Flahavan, Hartman, & Pearson, 1988) indicating a predominance of questions with a nonliteral emphasis at the elementary level. Current cognitive theory (see, for example, Prawat, 1989) suggests that factual, memory-type questions are *not* the type of questions that are likely to promote conceptual understanding and meaningful learning. As Wilen (1982) put it, "Theory suggests that teachers should ask higher-cognitive-level questions to have students apply learnings, while practice demonstrates that teachers ask low-cognitive-level questions to check recall of knowledge" (p. 5).

In sum, the bleak situation revealed by the national assessment data cited at the beginning of this report may exist for at least three important reasons: Students don't read much informational text; they aren't systematically taught how to read it; and they aren't encouraged toward conceptual understanding and meaningful learning by means of teacher questions.

The purpose of this study was to further investigate reading and questioning in science and social studies lessons. We were especially interested in teacher questioning practices surrounding a textbook-based lesson. In particular, we addressed the following questions:

1. How much text is read in science and social studies lessons?
2. Do teachers provide explicit instruction in how to read and learn from the text?
3. How is the text read?
4. How many questions do teachers ask?
5. When do teachers ask questions about the text?
6. Where do teachers' questions come from?
7. Where are the answers to questions located?
8. What is the relationship between source of questions and source of answers?
9. How much text must students read in order to answer questions?
10. Do teachers ask analysis, prediction, or application questions?

Method

Subjects

The subjects were 10 fourth-grade teachers from three Illinois school districts that had been participating in an ongoing, large-scale longitudinal study for four years prior to this study (Meyer, Wardrop, & Hastings, 1989a, 1989b). District A is in a somewhat self-contained, small farm community in the center of the state. The district is well known for its high student scores on standardized reading comprehension tests in the early grades. District B is in a village that is about 10 miles from the university town in which many of its citizens work. District C is in a suburb of a large city and is characterized by a high degree of ethnic diversity, including Blacks and Hispanics.

Materials

The data base for this study consisted of 12 lessons selected from a large body of approximately 192 lessons recorded as part of the previously mentioned longitudinal study during the 1987-1988 academic year. The corpus included audio recordings and field notes taken at six nearly equal intervals (rounds) throughout the year.

We selected the target lessons for this study on the basis of the following criteria: (a) the lessons had to be content area lessons focusing on either science or social studies; (b) the textbook was to be a primary resource in the lesson; (c) the lessons had to be at least 20 minutes long; (d) two lessons (one science, one social studies) were to be selected from each round; (e) as many teachers as possible were to be represented; and (f) as many questions as possible were to be represented. The resulting sample consisted of six social studies and six science lessons taught by ten teachers. Of these teachers, four taught only social studies lessons, four taught only science lessons, and two teachers taught both science and social studies lessons. The lessons ranged in length from 22 to 45 minutes, with a mean of 32 minutes. The total instructional time for the 12 lessons was 387 minutes. The science and social studies textbooks used during the lessons were also available to us.

Procedure

Each of the 12 lessons was transcribed into a word processing system using both the audio tape of the lesson and the detailed scripts (field notes) taken by a trained observer sitting at the rear of the classroom. The tape recorder was located in the back of the room with the observer. The teacher faced the students and the observer; hence, the students had their backs to the tape recorder. As a result, most of the teacher talk was clearly audible, but most of the student talk was not. Therefore, we had to use the teacher talk, supplemented by the observers scripts, as our main source of information about what was happening in the classroom.

The transcripts were parsed into "reading events." A reading event was defined as a segment of text designated by the teacher to be read, together with the questions that related to the target text segment. For example, the following activities would constitute a single reading event: The teacher asks a question unrelated to what has already been read, then calls on a student to read the next paragraph aloud to the class, and finally asks six more questions about the paragraph just read.

Once all lessons had been parsed into reading events, we identified all the questions in the transcripts. Initially, we counted all interrogative statements as questions. As we further examined the transcripts, however, we made two discoveries. First, many questions were restated or rephrased by the teachers, sometimes as many as eight times. Since such repeated questions would create redundancy in the data, we chose to include only one occurrence of a particular question. We counted as repetitions any rewordings or rephrasings that were obvious attempts to solicit a particular answer.

Second, we discovered that many of the interrogative statements were not true questions according to our intended meaning. Our purpose was to examine questions for which the teacher appeared to expect a student response. Many of the teachers' interrogative statements, however, did not seem to elicit, and in fact did not receive, an oral response. We refer to these questions as "rhetorical questions." We decided to exclude rhetorical questions from our main analysis, but we did conduct a separate analysis of these questions.

Our original data set included 1,028 questions. Of these, 333 were repetitions and 183 were rhetorical. When repetitions and rhetorical questions were eliminated, 512 "real" questions remained in the data set. The main analyses were done on these 512 real questions.

Once the questions had been identified, we developed a coding system for the lessons. The coding system corresponded to the kinds of questions we wished to address in the study. The following information was coded for each question:

1. What kind of lesson was it?: *Science* or *Social Studies*
2. Who read the target text segment? (The target text segment is the text read during a particular reading event.): *Student, Teacher,* or *Both*
3. How was the target text segment read?: *Silently* or *Aloud*
4. How long was the target text segment?: *Number of words* (approximate)
5. When was the question asked with respect to reading the target text segment?: *Before* or *After*

6. Where did the questions come from?

   (a) *Students' edition* of the textbook
   (b) *Teacher's edition* of the textbook
   (c) Teacher generated based on the *target text segment*
   (d) Teacher generated based on the *textbook* (besides the target text segment)
   (e) Teacher generated based on *other* sources unrelated to textbook content (for example, other classroom events, teacher's background knowledge)

7. Where were the answers to questions located?

   (a) *Text explicit*--explicitly stated in the target text segment
   (b) *Text implicit*--implicit in the target text segment, answerable using inferencing
   (c) *Scriptally implicit*--in the student's "script" or prior knowledge, including textbook information presumably read in previous lessons
   (d) *Graphic*--in a graphic such as a diagram or chart
   (e) *Activity*--in a classroom activity such as a demonstration or experiment

8. If the answer was text-based, how much text needed to be read to answer the question?: *Number of sentences*

9. Did the question involve analysis, prediction, or application?

Categories 6-9 represent our attempt to expand on question analysis systems used in previous research on teacher questions. Prior research has tended to categorize teacher questions using Bloom's taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956), or a variation of this taxonomy, which results in a hierarchical classification of questions. We were uncomfortable with the notion of "levels" of questions inherent in a hierarchy. Instead, we followed the lead of Pearson and Johnson (1978) and considered question-answer relationships. Thus, we examined both source of question (Category 6) and probable source of answer (Category 7). With regard to text-based questions, we expanded on the Pearson and Johnson tripartite division (text explicit, text implicit, and scriptally implicit) by also determining the *amount* of text that needed to be processed in order to answer a text-explicit or text-implicit question (Category 8). To some extent, this solved the problem of the breadth of the Pearson and Johnson text-implicit category, which includes everything from questions involving simple inferences across two or three sentences to questions about main ideas across many sentences or even paragraphs. Finally, we noted instances in which questions required analysis, prediction, or application categories (Category 9), which are also not captured in the Pearson and Johnson taxonomy.

Initially, one research assistant did all of the coding, using both transcripts and textbooks. As an extra cautionary measure, however, the entire data set was rechecked by the original coder and the first two authors; all inconsistencies were resolved in conference. Interrater reliability was established for the three subjective categories of the coding system: Where did the questions come from? Where were the answers to questions located? and Did the question involve analysis, prediction, or application? A random sample of "real" questions was selected for each teacher, for a total of 60 questions. Two raters independently coded the 60 questions in the three categories; the resulting agreement was 82%.

The data were analyzed using the SYSTAT statistical package (Wilkinson, 1987). The questions guiding the study were systematically explored using various tabulation and cross-tabulation routines.

As mentioned, rhetorical questions were analyzed separately from "real" questions. In analyzing rhetorical questions, we simply tried to identify the apparent purpose of these questions. Hence, a final research question was:

10. What were the apparent purposes of rhetorical questions?

Results

The results will be discussed in terms of the questions that guided the study.

How Much Text Was Read?

First, it should be noted that less than 7% of the original corpus of 192 lessons in this year of the longitudinal study met our criteria for inclusion in this study. For the 12 selected lessons, the average number of words read per lesson was 782. Table 1 presents the number of words read and the length of the lessons in minutes. There were differences between the two content areas in amount of text read. Fewer words were read in science than in social studies lessons ($\bar{X}$ = 459 words vs. $\bar{X}$ = 1,106 words). This difference was statistically significant ($F_{1,10}$ = 10, p = .01). It should also be noted from Table 1 that science lessons tended to be shorter than social studies lessons ($\bar{X}$ = 28.5 min. vs. $\bar{X}$ = 36 min.), although this difference in lesson time was not statistically significant.

[Insert Table 1 about here.]

Did Teachers Provide Explicit Instruction in How to Read and Learn From Text?

In the 387 minutes (approximately six and one-half hours) of lessons analyzed in this study, we found no instances of explicit instruction in how to read and learn from text. For example, the teachers did not explicitly teach or even encourage students to practice skills such as finding main ideas, summarizing, skimming, predicting, evaluating, taking notes, outlining, and so on. However, teachers *did* frequently provide assistance with pronunciation.

How Was the Text Read?

Specifically, is it read silently or aloud, and if read aloud, who does the reading? To answer these questions, we calculated the percentage of reading events in which the target text segments were read silently or aloud by students, teachers, or both.

Overall, by far the majority of reading events (87%) were read aloud. The result differed somewhat by subject area. For science lessons, 100% of the text was read aloud; for social studies, 80% was read aloud. For both subject areas, students usually did the oral reading (91% of reading events). Occasionally teachers read aloud (6%), or, rarely, both teachers and students read simultaneously (3%).

How Many Questions Did Teachers Ask?

We examined this question in several different ways. First, in keeping with the approach used by previous researchers, we calculated the average number of "real" questions asked per minute of instruction. For science, the result was 1.2 questions per minute (199 questions/171 lesson minutes); for social studies, the result was 1.5 questions per minute (313 questions/216 lesson minutes). The overall average across science and social studies was 1.3 questions per minute (512 questions/387 lesson minutes). Of course, if all 1,028 questions ("real" plus repetitions plus rhetorical) were included, the overall average increases to 2.6 questions per minute.

Second, we examined the relationship between amount of text read and number of questions asked. One way we did this was to calculate question density--the number of words read per question asked. Table 2 presents the results. The average across all teachers was one question for every 19 words of

text read. The range was from about one question for every six words of text to one question for every 32 words of text.

[Insert Table 2 about here.]

The teachers did not ask questions evenly throughout the text, however; rather, they clustered them at the ends of reading events. Therefore, we also calculated the length of target text segments as an index of how much text students actually read before they were asked questions about it. We classified the length of target text segments into three categories: (a) *short* target text segments were one paragraph or less; (b) *medium* target text segments were more than one but not more than two paragraphs; (c) *long* target text segments encompassed more than two paragraphs of text. As Table 3 shows, over half (56%) of the total of 86 target text segments were short. In other words, these teachers asked questions mostly after just a paragraph or less of text had been read. The remaining target text segments were approximately equally split between medium and long. There were, however, differences between content areas. Science teachers tended to use more short and medium target text segments and fewer long target text segments than did social studies teachers.

[Insert Table 3 about here.]

In sum, the teachers asked a high density of questions, and these were posed primarily after students had read just a single paragraph of text or less.

When Did Teachers Ask Questions About the Text?

The answer to this question depends on how "text" is defined. In this study, our basic unit of analysis was the target text segment--the text that the teacher designated to be read during a reading event. Table 4 shows the placement of questions with respect to target text segments. For all target text segments, about three-fourths of all questions were asked *after* the particular text segment; about one-fourth were asked about a text segment *before* it was read.

[Insert Table 4 about here.]

Looking at total target text segments, however, is somewhat misleading. Question placement looked quite different when we considered the first target text segment in comparison with all subsequent target text segments (see Table 4). Slightly over one-third (35%) of all of the questions teachers asked were asked *around* the first target text segment and almost one-fourth of all questions were asked *before* the first target text segment. The pattern was very different for subsequent reading events, where almost all questions were asked after a particular segment of text has been read.

In sum, the teachers asked many questions "up front" in lessons using textbooks. Almost one-fourth of the questions asked were posed before students began reading the text. The rest of the questions were asked after students had finished reading the particular segment of text designated by the teacher.

Where Did Teachers' Questions Come From?

Do teachers get their questions from the textbook, or do they make the questions up themselves? As shown in Table 5, only 10% of the questions asked were taken from the textbook; virtually all of those questions were questions appearing in the student edition. These teachers did not use the teacher's edition as a source of questions.

Most questions asked were made up by the teachers themselves. Overall, slightly more than half of the questions (53%) were based on the target text segment; another 28% came from some other part of the textbook. Teachers generated 9% of their questions from another source that did not seem to be

related to the textbook content. From Table 5, it appears that there were substantial differences between content areas in question source; however, most of this difference is attributable to the atypical questioning behavior of Teacher 4 in at least two of the categories.

[Insert Table 5 about here.]

In sum, the teachers in this study did not rely on publishers' questions but preferred to make up their own. Most of these questions were related to textbook content, especially the target text segment. About one out of ten questions appeared to be unrelated to the information in the text.

Where Were the Answers to the Questions Located?

We classified questions according to five possible information sources for the answers; text explicit, text implicit, scriptally implicit, graphics, or activities. Sometimes we found questions that either *required* more than one answer source or *could be* answered from more than one source. For example, some questions about a graphic seemed to require not only the graphic but also prior knowledge about how to interpret the graphic; these questions were coded as both "scriptally implicit" and "graphic." Other questions could be answered from either of two sources, such as the text or a graphic; these questions were also coded in more than one category. In all, 57 questions were double or triple coded. As a result, Table 6 reflects 575 possible answer sources, even though there were only 512 questions.

As shown in Table 6, the scriptally implicit, or prior knowledge, category accounted for half of the answer sources. (Recall that the scriptally implicit category includes not only background knowledge but also information in the textbook that had been presumably read in previous lessons.) The text currently being read accounted for only a little over one-fourth (27%) of the questions. Of the text-based answers, text explicit outnumbered text implicit 2 to 1 (18% vs. 9%). Therefore, less than one out of every ten questions teachers asked required students to make an inference from the text they had read.

[Insert Table 6 about here.]

Teachers also asked some questions requiring responses from graphics (10%), as well as from other ongoing classroom activities (14%). Science teachers asked about twice as many questions about activities as did social studies teachers (19% vs. 10%), which probably reflects the greater number of activities typically done in conjunction with science than with social studies lessons.

In sum, even when students were reading the textbook, most teacher questions did not require students to base their answers on the text currently being read. Rather, the questions called on students' knowledge and experience beyond the target text. Questions that were text-based tended to focus on explicitly stated information. Teachers asked relatively few questions demanding inferences from text.

What Was the Relationship Between Source of Questions and Source of Answers?

Table 7 presents the cross-tabulated data from the two previous tables about source of questions and source of answers. We will focus on two results that are uniquely disclosed in Table 7. (Note that, as with Table 6, the frequencies represent answer sources, which, because of some multiply coded questions, total 575, even though there were only 512 questions.)

[Insert Table 7 about here.]

First, of the relatively few questions teachers chose to ask from the textbook (both the student edition and the teacher's edition), one-third ($n = 24$) required text-explicit answers. Another way of looking at the same issue is that about one-fourth ($n = 24$) of all the text-explicit questions ($n = 101$) that these teachers asked came directly from the student textbook.

Second, out of the 502 questions that teachers asked on their own, about 15% had text-explicit answers, and about 8% had text-implicit answers. In contrast, 53% of the questions the teachers generated were categorized as scriptally implicit, that is, requiring prior knowledge to answer.

How Much Text Must Students Have Read in Order to Answer Questions?

For those questions requiring the text as an answer source (i.e., where the answer source was either text explicit or text implicit), we calculated the number of sentences that would probably be required to answer the question. The results are presented in Table 8.

[Insert Table 8 about here.]

For the text-explicit category, 62% of the answers were located in a single sentence. We found many instances in which the information required to answer the question was located in more than one sentence, but the answer was still explicitly stated.

For the text-implicit category, 17% of the questions could still be answered from a single sentence. Students could answer 83% of the text-implicit questions by reading six or fewer consecutive sentences of text.

Another way of looking at these data is that almost half (46%) of the questions teachers asked that required the text as an answer source could be answered from reading a single sentence. Almost 93% of text-based questions could be answered by reading no more than six consecutive sentences of text.

Did Teachers Ask Analysis, Prediction, or Application Questions?

We found 78 questions (15% of the total questions asked) that elicited substantial analysis of the text, predictions, or applications of information from the lesson.

What Were the Apparent Purposes of Rhetorical Questions?

Recall that we counted as "rhetorical" those questions that did not seem to elicit, and in fact did not receive, an oral response. We were surprised to discover that more than 25% of teacher questions (excluding repetitions) were rhetorical. Given the high frequency of these questions, we tried to determine the purpose or function they were serving. The following categories emerged from our analysis, although precise boundaries for the categories were often difficult to establish.

1. **Providing or emphasizing information.** The most common purpose for rhetorical questions was to make a statement or call attention to a particular fact. In this case, the teacher usually answered his or her own question. Examples include: (a) "Dark surfaces heat up faster than light surfaces just as our soil is already a few degrees higher than our water. Does that follow with the theory? Yes." and (b) "And the colors are called what? Spectrum."

2. **Inviting reflections on personal experiences.** Rhetorical questions sometimes encouraged students to reflect on specific personal experience, perhaps to help them relate new information to prior knowledge, as illustrated in the following: (a) "If you had something at home and your brother comes in and takes it, you'd probably hit him, don't you? All right. If the colonists come in. . . ."

and (b) "How many of you have ever done that before--you were out somewhere, like maybe you were on vacation in Florida and you thought, 'Oh, I think I'll wear this nice black shirt,' and almost died? That wasn't too wise of a choice, was it? Wrong choice of color, right?"

3. **Accessing prior content knowledge.** Some rhetorical questions served to remind students about, or to review, previously studied information. Examples are: (a) "Remember we talked about the different minerals? What is bauxite used for?" and (b) (In reference to an earlier reading event on immigration) "What countries were they? Take a look at the countries they talked about. They talked about what kinds of countries? They talked about the Netherlands, Sweden, and Norway, all those countries up here."

4. **Focusing attention.** Some rhetorical questions functioned as speech acts to direct students to some task, for example: "Can you find the Prime Meridian on your globe? The Prime Meridian. These are lines that go north and south. Look at the top of your globe. . . ."

5. **Setting a purpose for reading.** Rhetorical questions were sometimes used to set a purpose or to orient students to the reading they were about to do. For example, a teacher introduced a lesson about navigational aids by asking the following series of rhetorical questions:

> Have you ever wondered how people or ships keep from getting lost? Can you think about being out on the ocean? How big it is? Are there signs out there in the middle of the ocean? Stop signs? Fifty-five-miles-per-hour speed limit signs? And any of those big green signs that are on the highway that say this way to (X) or this way to (Y)? Ever wonder how they get places out there?"

6. **Repeating information.** Rhetorical questions sometimes repeated information in order to clarify it or to reiterate a comment so that all could hear and understand. Examples include: (a) "On the farms? I would disagree with that." and (b) ". . . and there wouldn't be waves caused by volcanoes erupting under the sea and stuff, right? OK, so waves are caused by wind. . . ."

Discussion

In the introduction, we made the point that students may have trouble comprehending and learning from informational text for two reasons. First, students are unfamiliar with the genre because they don't read much informational text, and second, the instruction they receive does not foster the development of conceptual understanding and meaningful learning. The results of this study replicate and extend prior research related to these points.

Prior research revealed that reading from textbooks is not a prevalent practice in content area classrooms. Our study confirmed this finding for the fourth graders in our sample. Of the 192 lessons in the data available to us, we found only a small subset of lessons (less than 10%) in which the textbook was used for a period of at least 20 minutes.

For the 12 lessons in this study where the textbook *did* appear to be the focus of the lesson, there was still relatively little text being read; the average across content areas was only 782 words read for lessons of an average length of 32 minutes. Therefore, based on this relatively small sample of fourth-grade teachers and lessons, we conclude that students, indeed, may not be getting much practice reading informational text.

Prior research also found that when the textbooks *are* used in classrooms, they tend to be read orally in small segments. We also found this pattern of round robin reading. The text was typically read aloud by students in segments no longer than a paragraph.

What does research say about round robin reading? In a succinct review of the research on silent reading, Wilkinson (1989) concludes that there is no clear research support in favor of silent reading compared to oral reading. However, he presents some compelling arguments in favor of silent reading. First, silent reading is more efficient than oral reading, so it should permit a faster pace and thus greater achievement. Second, in silent reading, all students are engaged in reading, whereas in oral reading, only one student at a time is actively engaged; the other students may or may not be attentive. Finally, Wilkinson suggests that oral reading may promote the belief that reading is a "performing art" focused on saying the words right, rather than the belief that reading is a meaning-getting process.

Despite these compelling arguments, teachers persist in round robin reading, probably for good reasons. According to Pearson and Gallagher (1983), elementary teachers use round robin reading because they believe the students cannot read the textbooks independently and need help to acquire the information presented in the textbook. In addition, Alvermann and Moore (in press), in a review of secondary school reading, suggest four main reasons for reading practices that may also pertain to round robin reading at the elementary level: (a) maintaining order (to enhance physical safety, emotional well being, and academic achievement); (b) satisfying demands for accountability (by covering course content in an orderly fashion); (c) promoting socialization (using controlled, routine reading to shape student behaviors into productive work habits); and (d) dealing with limited resources (for example, little time for lesson preparation, limited subject matter knowledge). If the practice of round robin reading is to change, teachers must be helped toward other solutions to the problems they face.

We turn now to our second claim--that instruction does not typically foster the development of conceptual understanding and meaningful learning from informational text. One area in which this study replicated previous findings was with regard to the explicit teaching of reading comprehension. Just as Durkin (1978-79) observed almost no explicit teaching of reading comprehension, we also found no such instruction in these 12 lessons. It was clear, however, that teachers did expect students to be able to learn from reading their textbooks, as the following line of questioning illustrates: "All right, what are they saying causes that kind of mountains? Think about that. What did they say? What causes a dome-shaped mountain? What did it say? What did it tell us?" Similar to the suggestion made by Durkin in her study, we found that the teachers in our study seemed more intent on having students learn the content than on learning how to learn from reading. Teachers may not explicitly teach reading skills and strategies for several reasons. They may not perceive a need to do so; they may not believe such instruction is appropriate during a content lesson; they may not know how to provide such instruction.

Another way in which instruction may not support conceptual understanding and meaningful learning from reading is in the area of teacher questioning. First, our study confirmed prior research that teachers *do* ask a great many questions. Daines (1986) found that teachers asked about 1.3 questions per minute. We found exactly the same frequency for "real" questions. About 65% of the questions teachers asked were posed after students had read short segments of text, usually a paragraph or less in length. Thus, the questioning pattern seems to be related to the practice of round robin reading that characterized these lessons. We expect that if the text were read silently, students would read more extended text and teachers would ask fewer questions.

Second, the types of questions teachers asked did not necessarily require answers that reflected or encouraged meaningful learning from the text. Only 27% of the questions were about the text currently being read. Of these questions with text-based answers, most were text explicit, requiring answers usually located in a single sentence. Only about 10% of teacher questions were text implicit, thus requiring students to make inferences from the text. Therefore, in this sample, students were not receiving much practice in answering questions that required conceptual understanding or promoted meaningful learning from what they had read in the textbook.

We also coded questions as to whether they required students to analyze, predict, or apply information from the text. We found an encouraging 15% of such questions. However, when we investigated these

questions further, we found that 67% of them were asked by only three teachers. Of the 52 questions asked by these three teachers, most (62%) were application-type questions, where students were expected to use information from the text in a novel way. An example of teacher talk including an application question is the following:

> Now this is what happens during the day. Because the land is warmer, the air above the land is rising. Because the water is cooler, the air above the water is moving over to take its place. What's going to happen at night when the land gets cooler and the water is warmer? Think about that. What's going to happen? What's going to happen?

Not all application questions were of this quality, however. Many required the use of a single definition or demanded only a yes/no or single word response. For example, one teacher, who asked about half (52%) of the application questions, used all the same kind of question--having students use a globe to identify the hemisphere (north, south, east, or west) or in one case, the latitude and longitude of selected countries. For example, "Where's the United States, northern or southern? Eastern or western? How about Argentina. Northern or southern hemisphere? Eastern or western hemisphere?" and so on.

As a result of our closer examination, we were forced to conclude that the encouraging figure of 15% analysis, prediction, and application questions was misleading. First, it was not representative of most teachers in our sample. Furthermore, many of the questions asked did not seem to lead to conceptual understanding or meaningful learning from text.

The students' and teachers' editions of the textbooks cannot be blamed for either the quantity or quality of teacher questions. Just as Shake and Allington (1985) found for reading instruction, we also found that teachers tended to use their own questions rather than textbook questions. For the content area lessons of our study, the teachers took only about 10% of their questions from the student textbook and less than 1% from the teacher's edition; the teachers made up the other 90% of their questions. We were puzzled as to why teachers don't rely more on textbook questions. Perhaps they feel the textbook questions are inferior to the ones they make up themselves. Perhaps they don't have the time or take the time to examine the textbook questions prior to teaching a lesson. Perhaps they are uncertain about how the textbook questions should be answered and feel more comfortable about their ability to answer their own questions.

Shake and Allington (1985) concluded that the quality of questions in the teacher's edition was often superior to the questions teachers asked on their own. These researchers' impression was that teacher-generated questions focused on trivial information, defining unfamiliar words, or were poorly formed. Based on our findings, we concur with this conclusion to some extent. We were particularly struck by a number of teacher questions that were so poorly formed they were incomprehensible to us, even in context. Some examples are: "What's wrong here that they might be able to get food from?" and "What is it that we're doing with the brown soil and just not planting anything in it at the time?"

The fact that teachers sometimes have trouble generating comprehensible, well-worded questions spontaneously may account for their frequent tendency to repeat or reword questions; perhaps in this way they hope eventually to communicate their intent. Sometimes, however, the relentless pursuit of a particular question or related questions may only confuse students. The following lengthy excerpt from one lesson is an example. (Blanks indicate student names.)

> "How are earthquakes and volcanoes related to the plates of crust? How are earthquakes and volcanoes related? You may have to think about this one for a second. How are those related? I was hoping that all of you would have your hands raised so you would know the answer. But _____ is the only one who has it up. _____, can you describe it for us?" Student asks a question. Teacher repeats, "Earthquakes and volcanoes. Start your sentence like this: 'Earthquakes and volcanoes usually occur. . . .'" Student responds. Teacher says "OK, but how are they related to the plates of the earth? How are they related to plates

of the earth, _____?" Student responds. Teacher says, "No, they don't always occur on the water. On the side of the water, you're saying here. No, they don't always occur around there. Earthquakes and volcanoes usually occur, _____?" Student responds. Teacher repeats, "Usually it takes a long time for them to happen . . . not always. Earthquakes and volcanoes usually occur, _____? I'm going to give you another word in that sentence. Earthquakes and volcanoes usually occur where?" Student responds. Teacher says, "No. _____." Student responds. Teacher says, "No. You don't have to show, because if you show one spot, that won't be right." Student responds. Teacher says, "OK, that's not right. Earthquakes and . . . remember, faults. Remember that word--faults. _____." Student responds. Teacher says, "You're so close." Student tries to finish. Teacher says, "OK, he has the idea now. Let's make a sentence out of this. Earthquakes and volcanoes usually occur where?" Student finishes answer. Teacher says, "He's got it. He said it. _____, can you say it also?" Another student tries to answer. Teacher says, "But you didn't use the word faults again. I want someone to make a sentence out of that using the word faults in there, _____." Student responds. Teacher says, "Earthquake belts and faults are two different things. An earthquake belt is where most of the earthquakes usually occur, like a line where they occur. That's an earthquake belt. All right. A fault does not always have to have earthquakes on it. Try again, _____." Student responds. "OK, I'll take that. What I was looking for is: Earthquakes and volcanoes usually occur where faults come together."

In this example, the teacher spends considerable time questioning students about a particular relationship, which apparently the students do not understand very well. The teacher seems more intent on students saying the particular sentence he has in mind than in having them understand the concept involved. The teacher finally answers his own question. Unfortunately, the teacher's answer is incorrect! (The correct statement is "Earthquakes and volcanoes usually occur where *plates* come together at a fault.") We expect this lengthy exchange confused as well as bored students.

Rhetorical questions may also confuse students. The fact that they are not intended to be answered sets them apart from other teacher questions. Confusion may also result from the fact that rhetorical questions serve many different purposes.

In sum, this study of fourth-grade science and social studies lessons replicates and extends previous research findings suggesting that (a) students do not get much practice reading informational text, and (b) instruction often fails to promote conceptual understanding and meaningful learning from reading informational text. The main extension of this study was a finer grained analysis of teacher questions than had been done in any previous study.

Our analysis scheme enabled us, for example, to distinguish answers based on the text versus other sources, and to determine the extent of text processed in response to questions. In addition, by separating "real" from "rhetorical" questions, we were prompted to further analyze the purposes of rhetorical questions.

The main limitation of the study is obvious--it is a small sample of lessons from a small sample of teachers at only one grade level. However, we are encouraged by the fact that the results of this study replicate those of previous studies.

The implications of this and related research are obvious but profound: If we want students to develop conceptual understanding and meaningful learning from reading informational text, we need to arrange quite a different learning environment than currently exists. We offer nothing new in suggestions of what needs to be done. For example, teachers need to teach students how to read informational text from the earliest grades. Teachers need to encourage students to read a great deal of informational

text. Teachers need to ask questions that promote conceptual understanding and meaningful learning. And so on. Ultimately, all of these changes point to a need for a change in teacher education. The complex problem we began with has no simple solution.

References

Alvermann, D. E., & Hayes, D. A. (1989). Classroom discussion of content area reading assignments: An intervention study. *Reading Research Quarterly, 24,* 305-335.

Alvermann, D. E., & Moore, D. W. (in press). Secondary school reading. In P. D. Pearson (Ed.), *Handbook of reading research* (2nd ed.). New York: Longman.

Anderson, R. C., Hiebert, E. H., Scott, J. A., & Wilkinson, I. A. G. (1985). Becoming a nation of readers: The report of the Commission on Reading. Urbana-Champaign: University of Illinois, Center for the Study of Reading.

Applebee, A. N., Langer, J. A., & Mullis, I. V. S. (1989). *Crossroads in American education*. Princeton, NJ: Educational Testing Service.

Beck, I. L., McKeown, M. G., & Gromoll, E. W. (1986). Issues concerning content and structure of expository text for young readers. Unpublished manuscript. University of Pittsburgh, Learning Research and Development Center.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, W. H. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York: Longman.

Ciardiello, A. V. (1986). Teacher questioning and student interaction: An observation of three social studies classes. *Social Studies, 77,* 119-122.

Daines, D. (1986). Are teachers asking higher level questions? *Education, 106,* 368-374.

Davey, B. (1988). How do classroom teachers use their textbooks? *Journal of Reading, 31,* 340-345.

Durkin, D. (1978-79). What classroom observations reveal about reading comprehension instruction. *Reading Research Quarterly, 14,* 481-533.

Flood, J., & Lapp, D. (1987). Forms of discourse in basal readers. *Elementary School Journal, 87,* 299-306.

Gall, M. D. (1984). Synthesis of research on teacher's questioning. *Educational Leadership, 42,* 40-47.

Gall, M. D. (1970). The use of questions in teaching. *Review of Educational Research, 40,* 707-721.

Good, T. L., & Brophy, J. E. (1973). *Looking in classrooms*. New York: Harper and Row.

Goodlad, J. I. (1984). *A place called school*. New York: McGraw-Hill.

Guszak, F. J. (1967). Teacher questioning and reading. *Reading Teacher, 21,* 228-234.

Hare, V. C., & Pulliam, C. A. (1980). Teacher questioning: A verification and an extension. *Journal of Reading Behavior, 12,* 69-72.

Hill, C. H. (1983). Round robin reading as a teaching method. *Reading Improvement, 20,* 263-266.

Meyer, L. A., Wardrop, J. L., & Hastings, C. N. (1989a). *Final report of trends from a longitudinal study of the development of science knowledge*. Final report submitted to the National Science Foundation. Urbana-Champaign: University of Illinois, Center for the Study of Reading.

Meyer, L. A., Wardrop, J. L., & Hastings, C. N. (1989b). *Interim report of trends from a longitudinal study of the development of reading comprehension*. Unpublished manuscript. Urbana: University of Illinois, Center for the Study of Reading.

O'Flahavan, J. E., Hartman, D. K., & Pearson, P. D. (1988). Teacher questioning and feedback practices: A twenty-year retrospective. In J. E. Readence & R. S. Baldwin (Eds.), *Dialogues in literacy research. Thirty-seventh yearbook of the National Reading Conference* (pp. 185-191). Rochester, NY: The National Reading Conference.

Pearson, P. D., & Gallagher, M. E. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology, 8*, 317-344.

Pearson, P. D. & Johnson, D. D. (1978). *Teaching reading comprehension*. New York: Holt, Rinehart, & Winston.

Prawat, R. S. (1989). Promoting access to knowledge, strategy, and disposition in students: A research synthesis. *Review of Educational Research, 59*, 1-41.

Ratekin, N., Simpson, M. L., Alvermann, D. E., & Dishner, E. K. (1985). Why content teachers resist reading instruction. *Journal of Reading, 28*, 432-437.

Shake, M. C., & Allington, R. L. (1985). Where do teachers' questions come from? *Reading Teacher, 38*, 432-438.

Smith, R. J., & Feathers, K. M. (1983a). Teacher and student perceptions of content area reading. *Journal of Reading, 26*, 348-354.

Smith, R. J., & Feathers, K. M. (1983b). The role of reading in content classrooms: Assumptions vs. reality. *Journal of Reading, 27*, 262-267.

Tyson-Bernstein, H. (1988). *A conspiracy of good intentions: America's textbook fiasco*. Washington, DC: The Council for Basic Education.

Wilen, W. W. (1982). *What research says to the teacher: Questioning skills for teachers*. Washington, DC: National Educational Association.

Wilen, W. W. (1984). Implications of research on questioning for the teacher educator. *Journal of Research and Development in Education, 17*, 31-35.

Wilkinson, L. (1987). *SYSTAT: The system for statistics*. Evanston, IL: SYSTAT, Inc.

Wilkinson, I. (1989). The contribution of silent reading within the social context of instruction. In S. McCormick & J. Zutell (Eds.), *Cognitive and social perspectives for literacy research and instruction. Thirty-eighth yearbook of the National Reading Conference* (pp. 501-509). Chicago, IL: The National Reading Conference.

Table 1

Number of Words Read and Length of Lessons

Teacher	Words/Lesson	Minutes/Lesson
Science		
1[a]	492	23
2	317	35
3	534	22
4	391	34
5	458	35
6[b]	561	22
Mean	458.8	28.5
Social Studies		
7	1228	42
8[a]	1001	29
9	734	38
10[b]	600	24
11	1081	38
12	1992	45
Mean	1106	36
Grand Mean	782.4	32.3

[a]Teachers 1 & 8 were the same.
[b]Teachers 6 & 10 were the same.

Table 2

Question Density: Number of Words of Text Read per Question

Teacher	Average no. of words/ questions
Science	
1[a]	17.0
2	21.2
3	28.1
4	5.8
5	12.7
6[b]	17.5
Social Studies	
7	27.9
8[a]	22.7
9	17.9
10[b]	11.8
11	15.4
12	31.6
Mean no. of words/question for all teachers	19.1

[a]Teachers 1 & 8 were the same.
[b]Teachers 6 & 10 were the same.

Table 3

Frequency of Target Text Segments

Teacher	Length of Target Text Segments: Short*	Medium	Long	Total
Science				
1[a]	4	1	1	6
2	2	2	0	4
3	0	2	1	3
4	6	1	0	7
5	5	1	0	6
6[b]	2	2	1	5
All-science	19	9	3	31
	61%	29%	10%	100%
Social Studies				
7	5	2	3	10
8[a]	1	1	4	6
9	4	2	1	7
10[b]	1	0	2	3
11	9	3	1	13
12	9	3	4	16
All social studies	29	11	15	55
	53%	20%	27%	100%
Total Teachers	48	20	18	86
	56%	23%	21%	100%

[a]Teachers 1 & 8 were the same.
[b]Teachers 6 & 10 were the same.

*Short = 1 paragraph or less
Medium = more than 1 paragraph, but not more than 2 paragraphs
Long = more than 2 paragraphs

Table 4

Question Placement in Relation to Target Text Segments

	First Target Text Segment	Later Target Text Segments	All Text Segments
Before	119 (24%)	4 (1%)	123 (24%)
After	59 (11%)	330 (65%)	389 (76%)
Total	178 (35%)	334 (65%)	512 (100%)

Table 5

Frequency of Question Sources

	Direct from:			Teacher-generated from:		
Teacher	Student Edition	Teacher Edition	Target Text Segment	Textbook	Other	Total
Science						
1[a]	5	0	15	8	1	29
2	0	0	3	7	5	15
3	0	0	3	8	8	19
4	7	0	12	29	20	68
5	6	0	3	25	2	36
6[b]	6	1	12	8	5	32
All-science	24	1	48	85	41	199
	12%	1%	24%	43%	21%	100%
Social Studies						
7	10	0	32	0	2	44
8[a]	8	0	16	19	1	44
9	1	0	35	5	0	41
10[b]	0	1	21	29	0	51
11	7	0	59	4	0	70
12	0	0	61	2	0	63
All social studies	26	1	224	59	3	313
	8%	0%	72%	19%	1%	100%
Total Teachers	50	2	272	144	44	512
	10%	0%	53%	28%	9%	100%

[a]Teachers 1 & 8 were the same.
[b]Teachers 6 & 10 were the same.

Table 6

Frequency of Answer Sources

Teacher	Text Explicit	Text Implicit	Scriptally Implicit	Graphics	Activity	Total
Science						
1[a]	15	5	8	4	4	36
2	0	1	14	4	0	19
3	3	0	13	1	3	20
4	7	12	43	3	19	84
5	5	3	10	9	15	42
6[b]	4	2	26	4	5	41
All science	34	23	114	25	46	242
	14%	10%	47%	10%	19%	100%
Social Studies						
7	14	1	6	5	27	53
8[a]	16	2	24	3	0	45
9	21	4	9	0	7	41
10[b]	3	4	44	0	0	51
11	6	9	52	7	0	74
12	7	10	37	15	0	69
All social studies	67	30	172	30	34	333
	20%	9%	52%	9%	10%	100%
Total teachers	101	53	286	55	80	575
	18%	9%	50%	10%	14%	100%

[a]Teachers 1 & 8 were the same.
[b]Teachers 6 & 10 were the same.

Table 7

Frequency of Question Source by Answer Source

	Source of Questions							
	Direct from:			Teacher-generated from:				
Source of Answers	Student Edition	Teacher Edition	Sub-Total	Target Text Segment	Textbook	Other	Sub-Total	Total
Text Explicit	24	0	24	73	4	0	77	101
Text Implicit	10	1	11	35	7	0	42	53
Scriptally Implicit	19	0	19	124	110	33	267	286
Graphics	9	0	9	27	15	4	46	55
Activity	9	1	10	33	26	11	70	80
Totals	71	2	73	292	162	48	502	575

Table 8

Number of Sentences Read to Answer Text-Based Questions

	Number of Sentences in Answer Source												
	1	2	3	4	5	6	7	8	10	11	14	16	Total
Text Explicit	62	19	8	7	2	1	1	1	0	0	0	0	101
Text Implicit	9	9	3	9	9	5	0	1	2	2	1	3	53
TOTAL	71	28	11	16	11	6	1	2	2	2	1	3	154